

## CLAIM AMENDMENTS

1           1. (currently amended) A method of applying a thin film  
2 coating to a substrate, comprising the steps of:

3           (a) mounting a substrate to be coated on a substrate  
4 holder in an evacuable chamber and so that said substrate is  
5 spacedly juxtaposed with a crucible containing a component of a  
6 coating to be applied to said substrate;

7           (b) evacuating said chamber;

8           (c) positioning a shutter between said crucible and said  
9 substrate and heating said component in said crucible with a high  
10 energy electron beam;

11          (d) admitting a gas mixture to said chamber containing at  
12 least one gas reactive with said component to form said coating;

13          (e) connecting said substrate holder to a radio frequency  
14 or pulsed direct current source so that said substrate holder is  
15 poled cathodic and a plasma is formed at least around said  
16 substrate to create a self bias of several hundreds of volts on  
17 said substrate holder and a surface of said substrate is bombarded  
18 with particles from the plasma;

19          (f) withdrawing said shutter from its position between  
20 said crucible and said substrate, bombarding said component with  
21 low energy electrons from a low-energy electron source independent  
22 of said high energy electron beam to ionize said component at least  
23 in part and depositing a reaction product of said component and  
24 said at least one gas on said substrate; and

25                   (g) controlling the ionization of said component so that  
26   said self bias is reduced by at least 50%.

1                   2.   (original)   The method defined in claim 1 wherein  
2   said self bias and said plasma are produced by connecting said  
3   substrate holder to a radio frequency source.

1                   3.   (original)   The method defined in claim 2 wherein the  
2   deposition of said coating is monitored and the coating is  
3   terminated when a predetermined thickness of the coating is  
4   reached.

1                   4.   (original)   The method defined in claim 1 wherein  
2   said thin film coating is an optical coating.

1                   5.   (original)   The method defined in claim 1, further  
2   comprising the step of depositing a reaction product of a component  
3   from another crucible and said at least one gas on said substrate  
4   following the deposition of said coating thereon.

6.   (Cancelled)

1                   7.   The method defined in claim ~~6~~ 1, further comprising  
2   the step of directing another electron beam from ~~a-further~~ an  
3   electron beam gun onto said component in said crucible.

## Claims 8 to 18 (Cancelled)

1           19. (currently amended) A method of applying a thin  
2 film coating to a substrate, comprising the steps of:

3           (a) mounting a substrate to be coated on a substrate  
4 holder in an evacuable chamber and so that said substrate is  
5 spacedly juxtaposed with a crucible containing a component of a  
6 coating to be applied to said substrate;

7           (b) evacuating said chamber;

8           (c) positioning a shutter between said crucible and said  
9 substrate and heating said component in said crucible with a high  
10 energy electron beam;

11          (d) admitting a gas mixture to said chamber;

12          (e) connecting said substrate holder to a radio frequency  
13 or pulsed direct current source so that said substrate holder is  
14 poled cathodic and a plasma is formed at least around said  
15 substrate to create a self bias of several hundreds of volts on  
16 said substrate holder and a surface of said substrate is bombarded  
17 with particles from the plasma;

18          (f) withdrawing said shutter from its position between  
19 said crucible and said substrate, bombarding said component with  
20 low energy electrons to ionize said component at least in part and  
21 depositing said component and said at least one gas on said  
22 substrate; and

23          (g) controlling the ionization of said component so that  
24 said self bias is reduced by at least 50%.